Panel Discussion: Training Resources

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UCAR's COMET Program

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University of Wisconsin-Madison
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CIMSS/SSEC University of
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Bernie Connell
Cooperative Institute for
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Atmosphere

Leroy Spayd
NWS – Chief Learning Office

José Manuel Gálvez
Research Meteorologist
and Instructor

Moderator: Janel Thomas *(GOES-R Product Readiness & Operations Training and User Liaison)*

We will be using live polling during this panel using sli.do code #:5699

COMET's MetEd Online Learning Resources for Environmental Satellites

Patrick Dills
UCAR's COMET Program

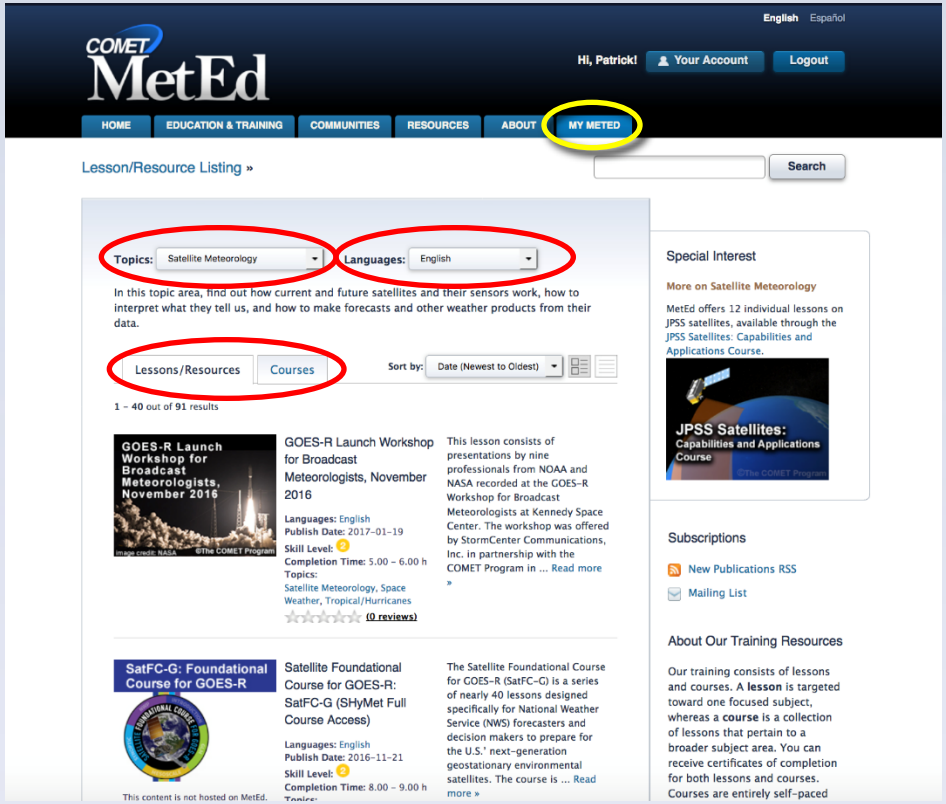
18 July 2017

Panel Discussion: Training Resources
New York City, NY

Distance Learning via the MetEd Website

- Users: 500,000+
- Universities: 2056
- International users: 169,863
- Over 600 lessons in over 20 Earth science topic areas
- Some available in other languages including:
  - Spanish (143)
  - French (75)
  - Portuguese (5)
  - and others recently added in German, Chinese, Indonesian

Satellite Meteorology Topic Area: Lessons and Courses…



- Lessons: 93
- SatMet lessons in other languages:
  - Spanish (34)
  - French (29)
  - Portuguese (3)
  - German (1)
- Courses: 8
- Courses in other languages:
  - Spanish (1)
  - French (1)
  - Portuguese (1)

Satellite Specific Lessons and Courses:

- Over 90 Satellite-specific lessons on MetEd, and four multi-lesson courses, one on GOES-R, another on JPSS (94 ENG, 34 SPA, 29 FRA, 3 POR)
- 5 unique multi-lesson courses, one on GOES-R, another on JPSS
- Over 20,000 English satellite lesson user sessions per year
- Recent publications:
  - 8 lessons for the "*SatFC-G Foundational Course for GOES-R*"
  - A distance learning course: "*JPSS Satellites: Capabilities and Applications Course*"
  - *Updated lesson, "Advances in Space-Based Nighttime Visible Observation, 2nd Ed.*

Audience Question

- How would you like online educational resources to support your use of NOAA satellite products?

  a. Focused topic lessons that are engaging and highly interactive

  b. A mix of individual lessons and courses organized by topic area

  c. Series of short lessons focused on various satellite and remote sensing principles, from basic to advanced

  d. Other

NOAA Satellite Conference Training Panel Discussion

The VISIT Program at CIMSS and CIRA

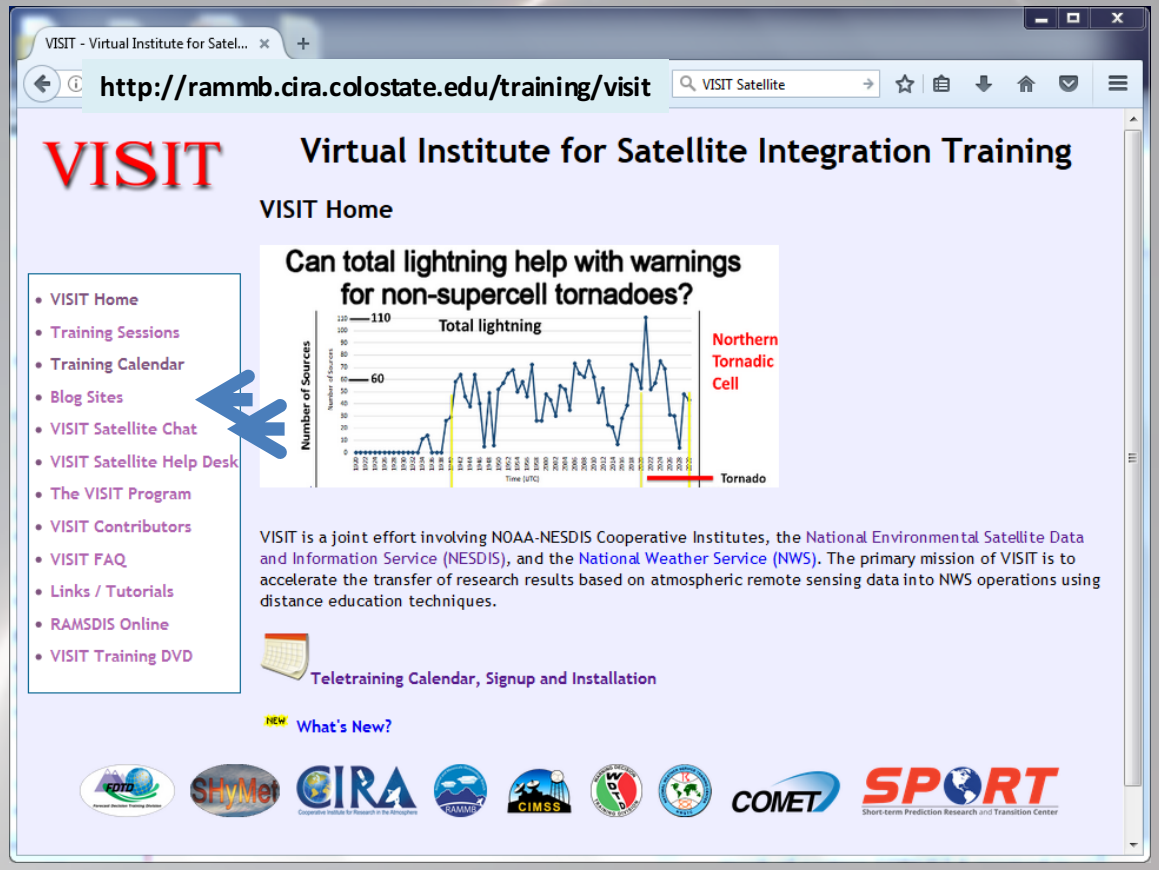
Scott S. Lindstrom
University of Wisconsin-Madison
Space Science and Engineering Center
Cooperative Institute for Meteorological Satellite Studies

What is VISIT / Who creates content

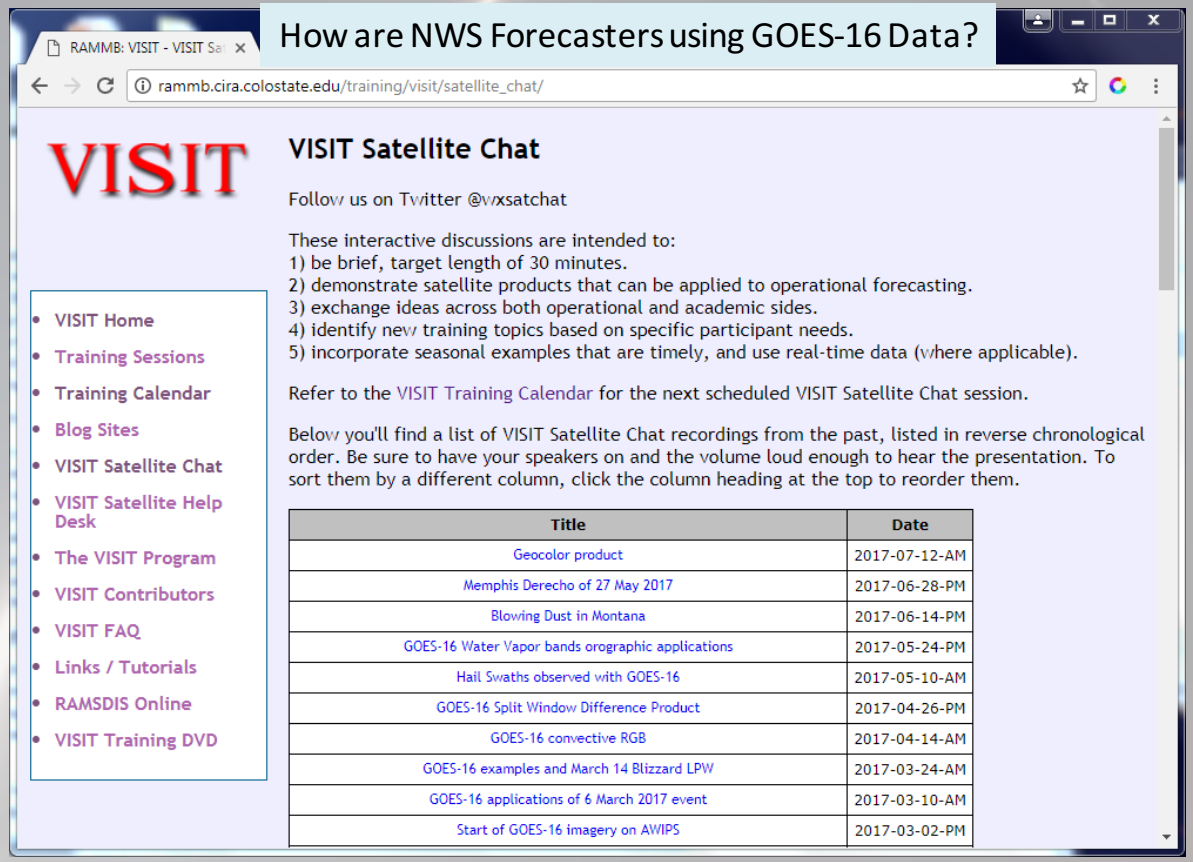
- Virtual Institute for Satellite Integration Training
  - Trainer and those being trained aren't in the same room
- Delivery methods include VISITview software, other webinars, blogs, Quick Guides, Fact Sheets…

- Scott Lindstrom and Scott Bachmeier (UW Madison)
- Dan Bikos, Ed Szoke, Bernie Connell (Colo. State U)
- Brian Motta and LeRoy Spayd at OCLO
- Several Emeritus members!

Learn more about VISIT on-line



FDTD GOES-16 Webinars aka Satellite Chats



Blogs


VISIT - The VISIT Program
rammb.cira.colostate.edu/training/visit/blogs.asp
VISIT
Blogs
VISIT Meteorological Interpretation Blog
CIMSS Satellite Blog
CIRA/RAMMB GOES-R Proving Ground Blog
GOES-R and JPSS Satellite Liaison Blog
CIRA VIIRS Imagery and Visualization Blog
GOES-R Proving Ground at NOAA's Hazardous Weather Testbed
The Wide World of SPoRT Blog
Seeing the Light: VIIRS in the Arctic Blog
VISIT Home
Training Sessions
Training Calendar
Blog Sites
VISIT Satellite Chat
VISIT Satellite Help Desk
The VISIT Program
VISIT Contributors
VISIT FAQ
Links / Tutorials
RAMSDIS Online
VISIT Training DVD
SHyMet
CIRA
COMET
SPORT

Thank you for your attention!

Questions about VISIT?

scott.lindstrom@noaa.gov / dan.bikos@noaa.gov

GOES-R Proving Ground

Collaborative effort between the following…

- GOES-R Program Office
- NOAA Cooperative Institutes (CIMSS and CIRA)
- NASA SPoRT
- NOAA Testbeds
- NWS Forecast Offices and NCEP

User community is prepared for GOES-R imagery and data that has improved spectral resolution, spatial resolution, and temporal flash rate.

Emphasis on the R2O-O2R process

Demonstration products provide forecasters the opportunity to:

- become trained (preoperational)
- identify weaknesses and errors
- identify different utilities

GOES-R Proving Ground Training Overview

GOES-R Program has been committed to providing extensive training for the operational and educational communities.

Training has focused on…

- use of GOES-R data and products
- methods for interpreting GOES-R data
- better understanding of atmospheric sciences and mesoscale meteorology

Training has been developed and provided by a number of partners across the weather enterprise through the GOES-R Proving Ground, e-learning training modules, seminars, weather event simulations, and special case studies.

GOES-R Proving Ground Satellite Liaisons

GOES-R Program Office vision in 2005 was to fund 2-3 Satellite Liaisons that would be integrated side by side with forecasters at NCEP National Centers.

GOES-R implemented the Satellite Liaison position to…

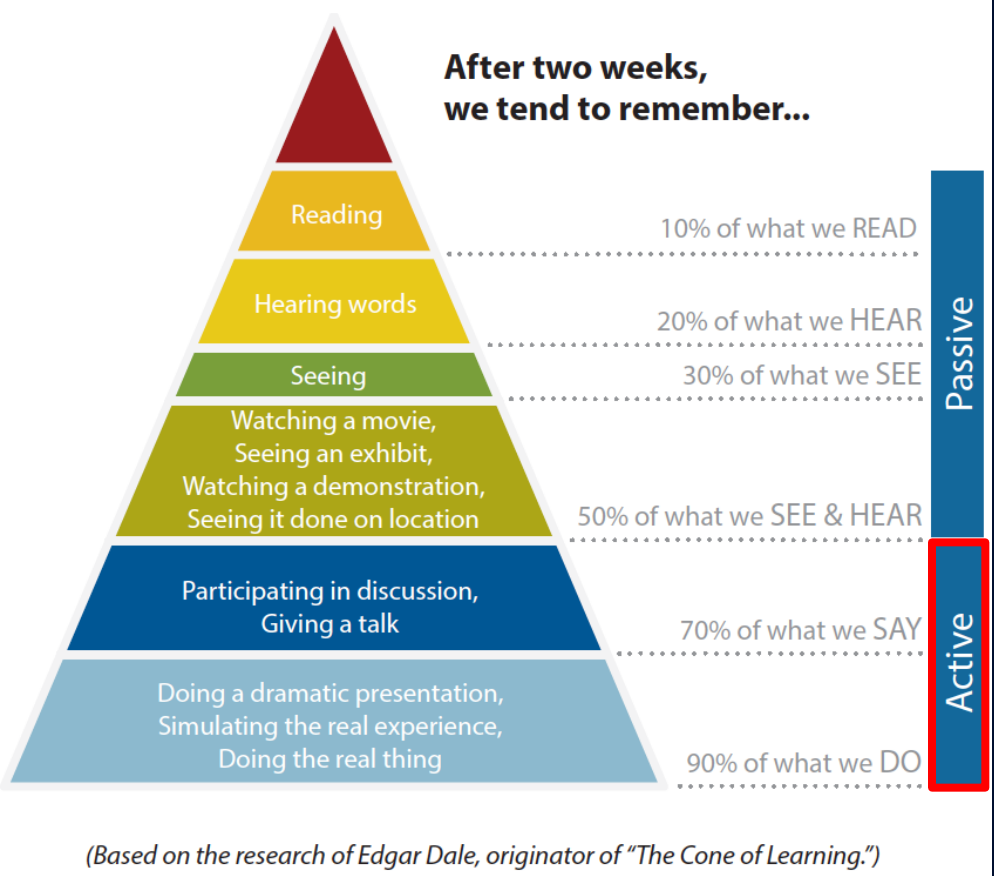
- prepare/train forecasters for data that will be available on GOES-R
- ease the transition of research to operations
- become the satellite subject matter experts at their respective facilities

In 2008, the first Satellite Liaison was placed in the Storm Prediction Center.

There are currently 8 Satellite Liaisons…

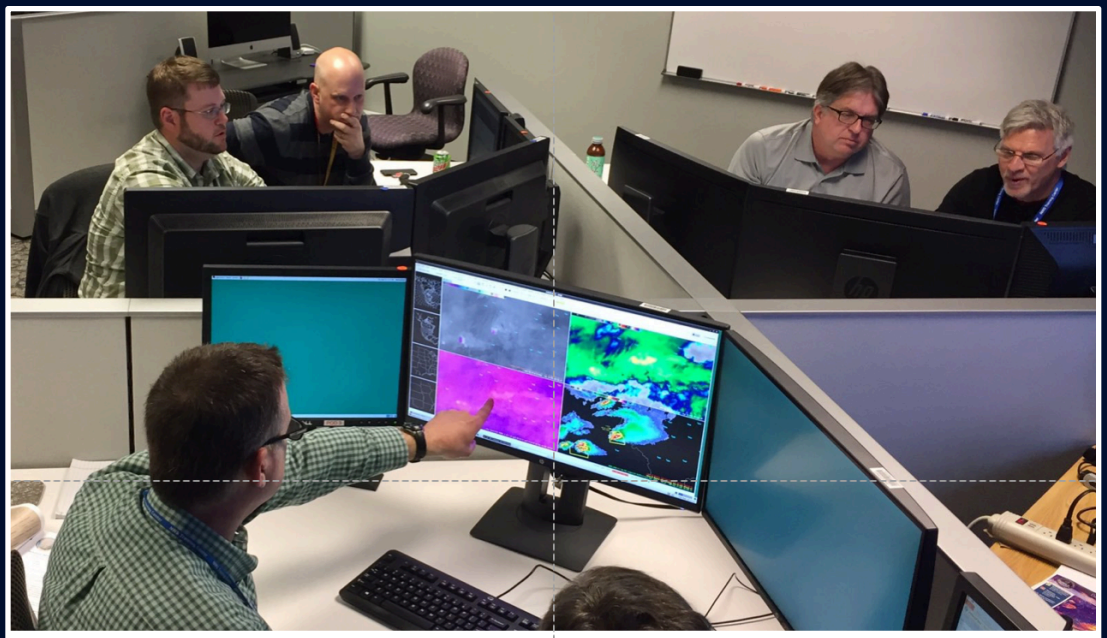
- Storm Prediction Center
- Ocean Prediction Center, Weather Prediction Center, Tropical Analysis & Forecast Branch, Satellite Analysis Branch
- National Hurricane Center (1/2 time)
- Operations Proving Ground
- Alaska Region (1/2 time)
- Pacific Region (1/3 time)

Cone of Learning



(Based on the research of Edgar Dale, originator of "The Cone of Learning.")

Cone of Learning



The key to creating a successful adult learning experience is "interactivity that engages the learner's mind to do those things that improve ability and readiness to perform effectively."

Michael Allen,
Expert in Learning Research and Instructional Design

NOAA's contributions to International Activities for Training in Satellite Meteorology via the WMO VLab

Bernie Connell

Cooperative Institute for Research in the Atmosphere

What is the WMO Virtual Laboratory for Education and Training in Satellite Meteorology?

A worldwide collaborative network connecting training Centres of Excellence (CoEs) and Satellite Operators

Mission: To improve the utilization of data and products from meteorological and environmental satellites.

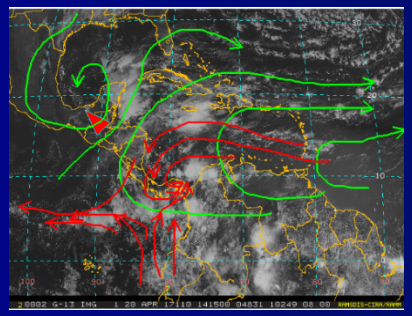
VLab objectives

- To achieve better exploitation of data from the Space Based global observing system
- To globally share knowledge, experience, methods, and tools related to satellite data, *especially in support of WMO Members that have limited resources.*

Training event at the CoE Barbados May 2016

A few of the Key points of the VLab strategy 2015-2019

Provide support to education and training among WMO Members through:



- The delivery of Regional Focus Group (RFG) sessions
- The organization of Training Event Weeks
- Active support in the introduction of the new generation of satellites
- Encourage the translation of training material.

http://rammb.cira.colostate.edu/vlab

What is your biggest hurdle to understanding and using GOES-16 imagery and products?

a. Having access to all GOES-16 image channels (Level 1 or Level 2 data)
b. Having low cost access to image display and processing software.
c. Having training resources in my native language.
d. Having enough person resources and computer resources to implement the changes necessary to view and query the data (Level 1 or Level 2).
e. Other ...

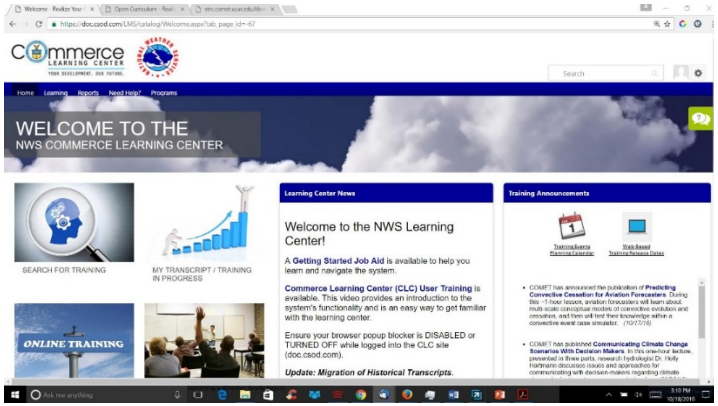
Cual es su principal dificultad para usar imagenes y productos del satelite GOES-16?

a. Tener acceso a todos los canales de GOES-16 (Nivel 1 o 2)
b. Tener acceso de bajo costo a software para procesar y desplegar imagenes.
c. Disponibilidad de materiales de capacitacion en mi idioma.
d. Escasez de recursos materiales y computacionales para utuilizar datos a Nivel 1 o 2.
e. Otra ...

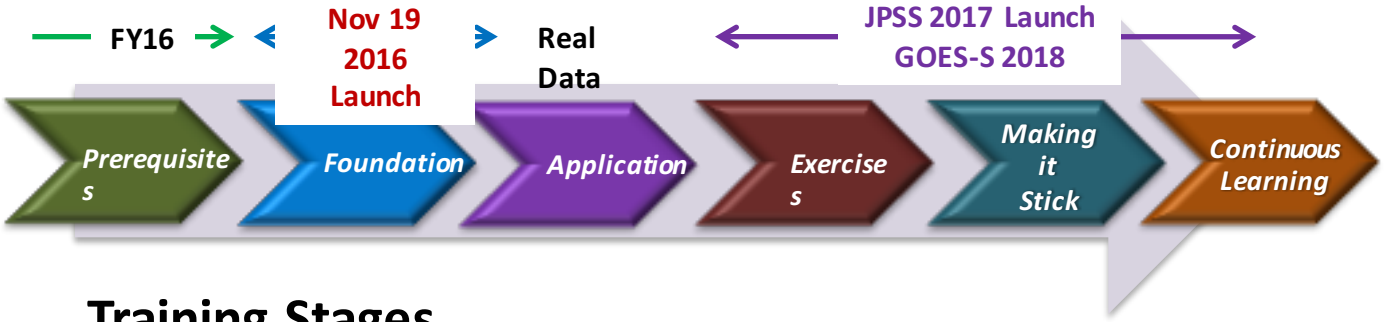
National Weather Service/NOAA

Leroy Spayd
NWS – Chief Learning Office

NOAA Satellite Conference
Training and Education Panel
Tuesday July 18, 2017



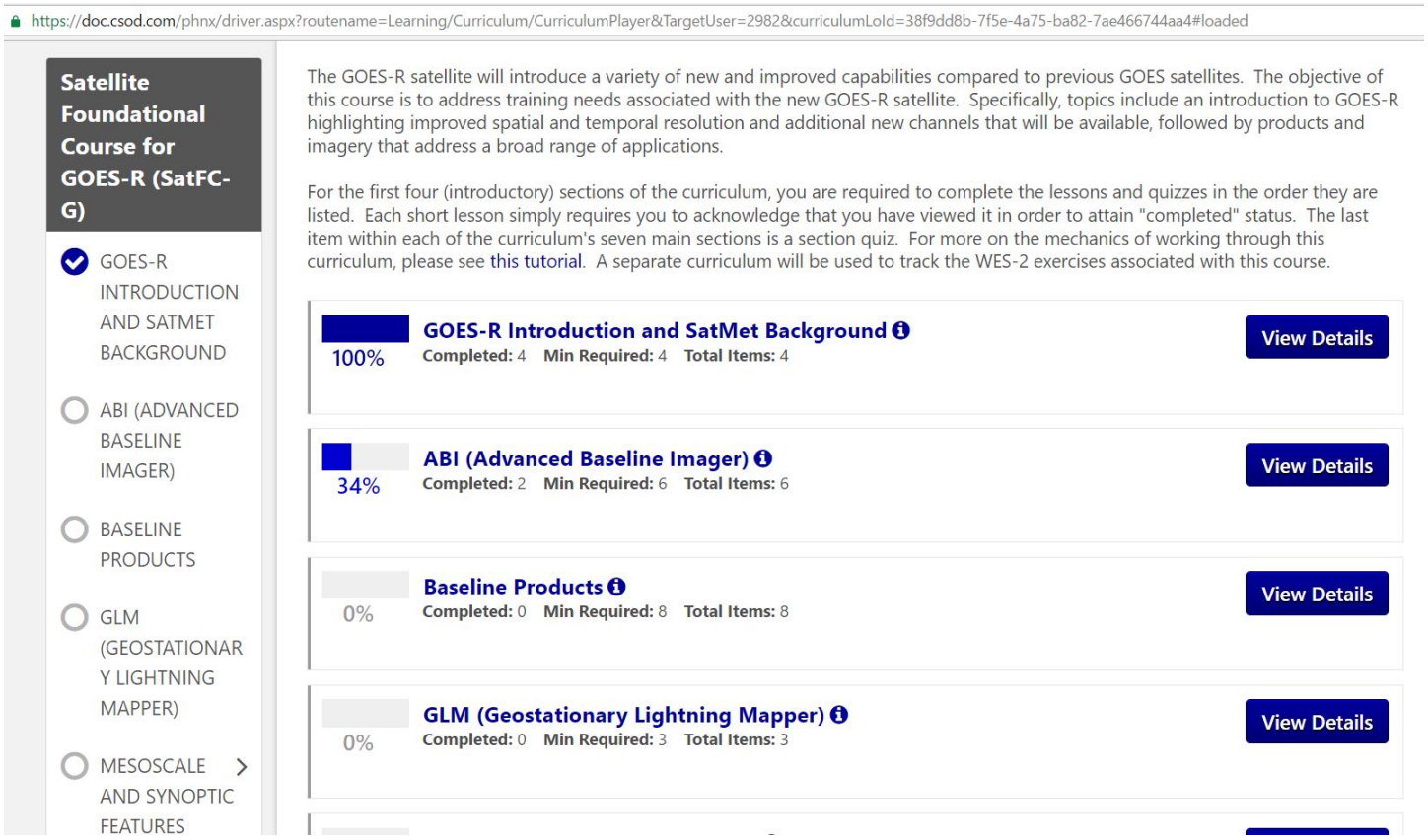
Satellite Training Timeline



Training Stages

- Prerequisites – overall basics
- **Foundation Course (8-15 hours) – satellite specifics**
- **Application – operational setting**
- **Exercises – simulations, practice**
- Making it Stick – multi-situational, sharing
- Continuous Learning – evolve and update

Satellite Foundational Course – 2000 completions in NWS (over 98%)



Satellite Foundational Course

Individual training modules are listed by "Title" and grouped under common topic categories. To sort by column, click the column heading at the top to reorder them. Length is given in minutes.

Topic	Title	Length	Contributor	Developed
Introduction	Basic Principles of Radiation	15	COMET	2016
Introduction	Basic Operations of ABI on GOES-R	15	Lindstrom (CIMSS)	2016
Introduction	GOES-R ABI Visible and Near-IR Bands	15	COMET	2016
Introduction	GOES-R ABI Near-IR Bands	15	COMET	2016
Introduction	GOES-R ABI IR Bands, Excluding Water Vapor	30	COMET	2016
Introduction	GOES-R ABI Water Vapor Bands	25	Bikos & Szoke (CIRA)	2016
Introduction	GOES-R Multi-channel interpretation approaches	30	Lindstrom (CIMSS)	2016
Introduction	GOES-R Aerosols in AWIPS	10	Lindstrom (CIMSS) & Kondragunta	2016
Introduction	GOES-R Cloud and microphysical products, fog and low stratus	15	Lindstrom (CIMSS)	2016
Introduction	GOES-R Fire characterization, land surface temperature and snow	10	Lindstrom (CIMSS)	2016
Introduction	GOES-R Baseline Product: Hurricane Intensity Estimate	10	Dagg (CIRA) & Olander	2016
Introduction	GOES-R Baseline Product: Rainfall rate	10	Bikos (CIRA) & Kuligowski	2016
Introduction	GOES-R Baseline Product: Legacy Atmospheric Profiles	10	Lindstrom (CIMSS)	2016
Introduction	GOES-R Baseline Product: Derived Motion Winds	10	Lindstrom & Bachmeier (CIMSS)	2016
Introduction	GOES-R Baseline Product: Volcanic Ash	10	Lindstrom (CIMSS) & Pavolonis	2016
GLM	Introduction to the GLM	30	COMET	2016
GLM	Visualizing the Geostationary Lightning Mapper (GLM) in AWIPS	10	Stano (SPoRT)	2016

Satellite Foundational Course - Orientation

2. YouTube video:

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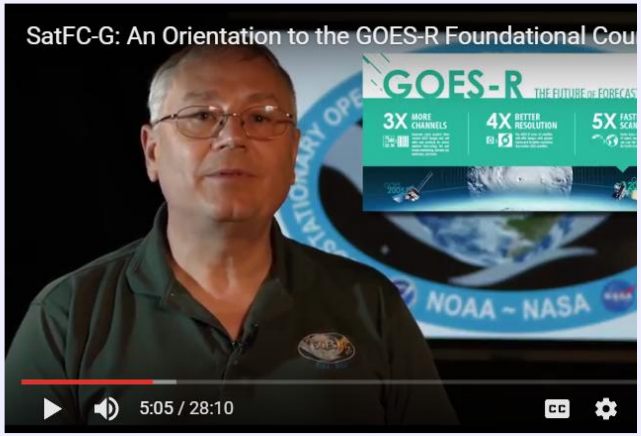


JPSS

- SatFC-J being planned for NWS and external users – led by JPSS funded CIRA Satellite Liaison, NWS NOAT & STAT
- Learning Objectives completed – development underway
  - Introducing JPSS
  - Introducing Microwave remote sensing
  - Basic Forecast Applications
  - Product Applications

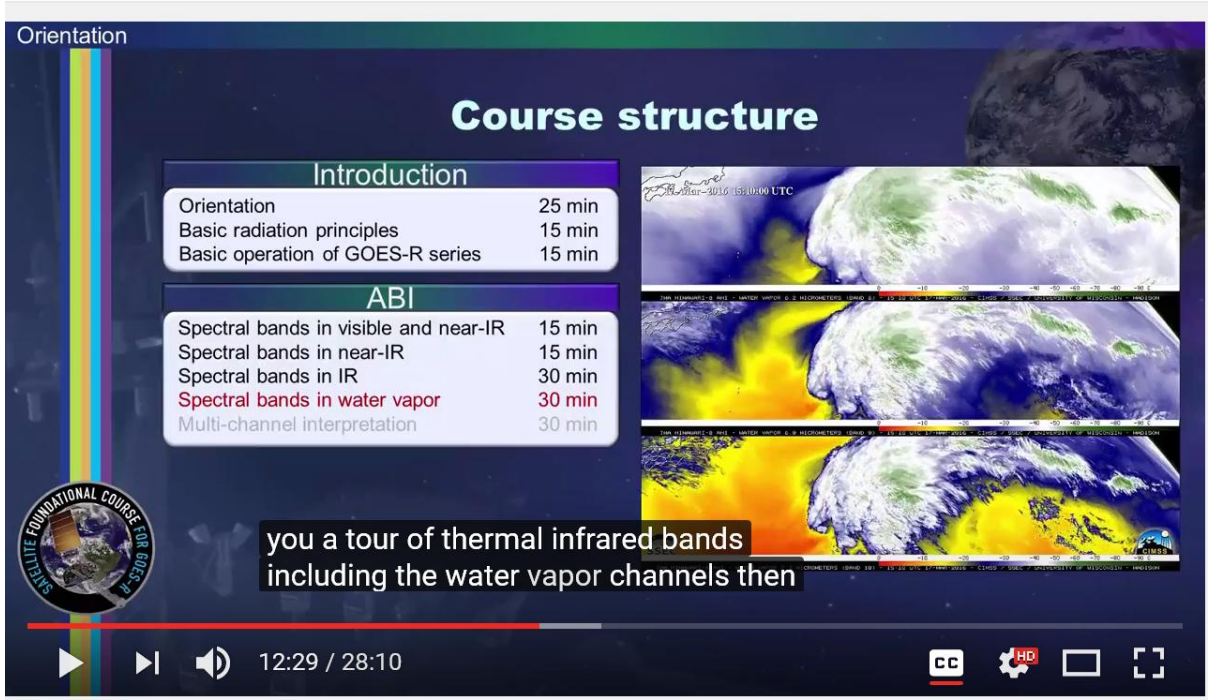
Questions?

For External Non-NOAA Users:

http://rammb.cira.colostate.edu/training/shymet/satfc-g_intro.asp

Register for course by sending email to:

nws.oaa.clo.shymet@noaa.gov

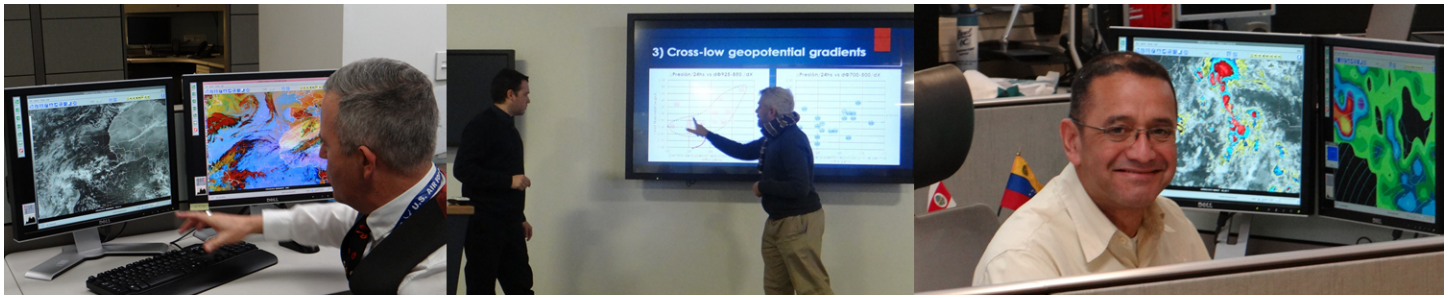


Audience question

- The most important aspect of GOES-16 to me is:
- 1. The info from the 11 additional bands
- 2. Increased resolution of the data
- 3. Fast scanning of high resolution sectors
- 4. Three water vapor bands instead of One

WPC International Desks /NWS/NOAA

Trainings on Weather Analysis and Forecasting since 1988



José Manuel Gálvez
Research Meteorologist and Instructor

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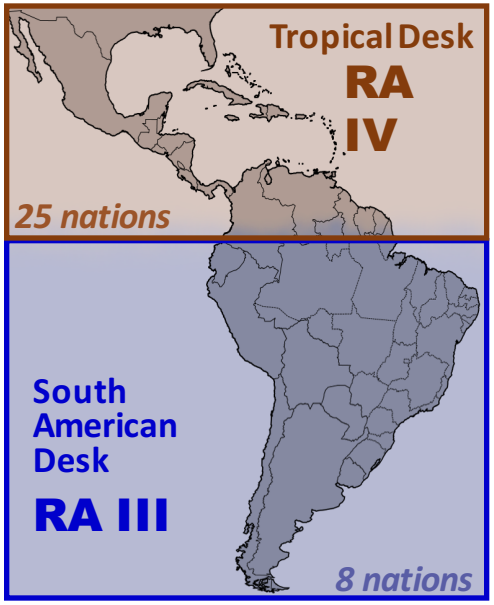
The WPC International Desks

Trainings on Weather Analysis and Forecasting for the Americas

- **Training program for forecasters**
  - sponsored by the US State Department in partnership with the WMO and Met Services in WMO-RA III and IV (Americas), since 1988.
  - 2 desks: Tropical and South American, located at NCEP in College Park, MD.
- **Training focus:**
  - Concepts, methods and tools to analyze and forecast the weather with emphasis on QPF.
  - We **largely rely and train on interpretation of satellite imagery** and derived products.



Training Strategy

1. In-house training

-4-month-long

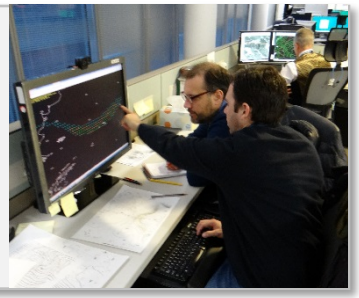
-2 fellows per desk

-Fellows staggered

-~12 international fellows per year.

Train the trainer concept

Experienced fellows assist with the training of their peers, and are encouraged to become trainers when returning to their countries



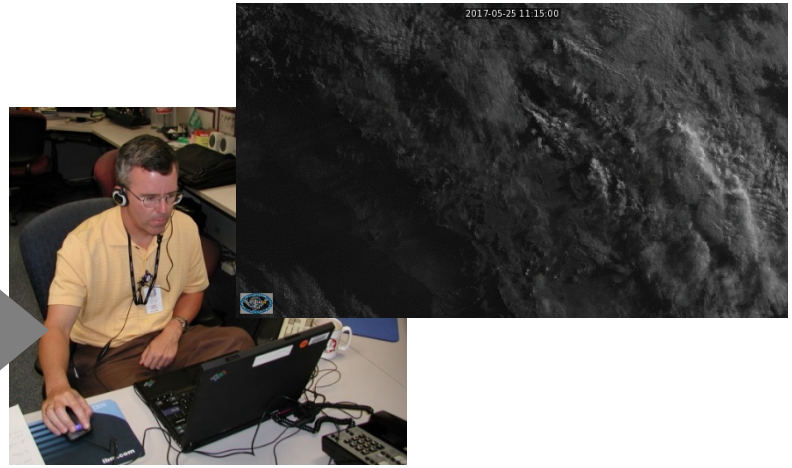
2. International Workshops

- 2-4 per year

3. Online training

-Vlab, once per month

Emphasis on satellite data analysis.



Goals and some numbers

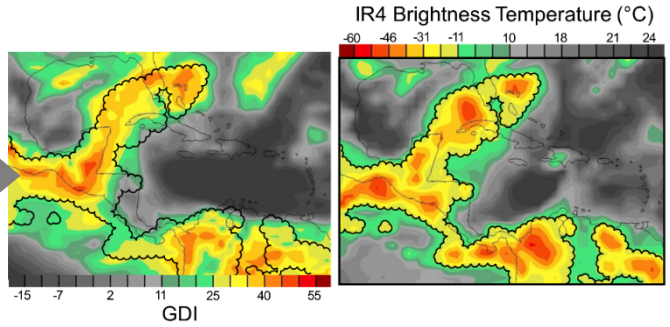
GOALS:

1. Enhance the scientific capacity of participating Met Services.
2. Fulfill the US NWS international commitment to provide numerical weather guidance to the Americas.
3. Tighten community relations.
4. Contribute to the science in the region (e.g. Galvez-Davison Index GDI for forecasting thunderstorms).

Statistics as of July 2017

Desk	Years	Trainees
South American	Since 1988	**172** (8 nations)
Tropical	Since 1992	**152** (25 nations)
Saudi	1999-2002	**14** (Saudi Arabia)
Visiting Instructor	Since 2007	**7** (4 nations)

We have trained > 340 meteorologists

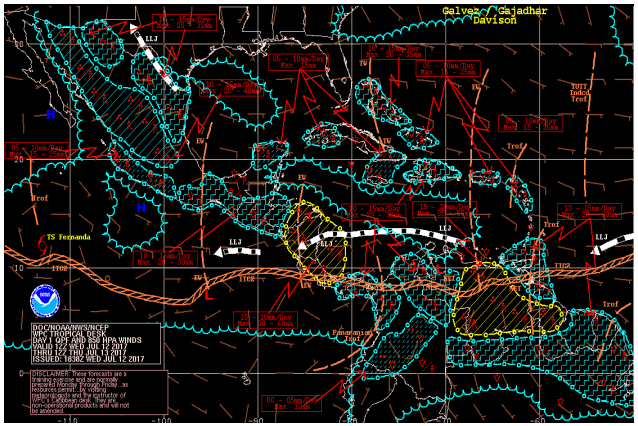


Sample of a GDI forecast vs cold clouds

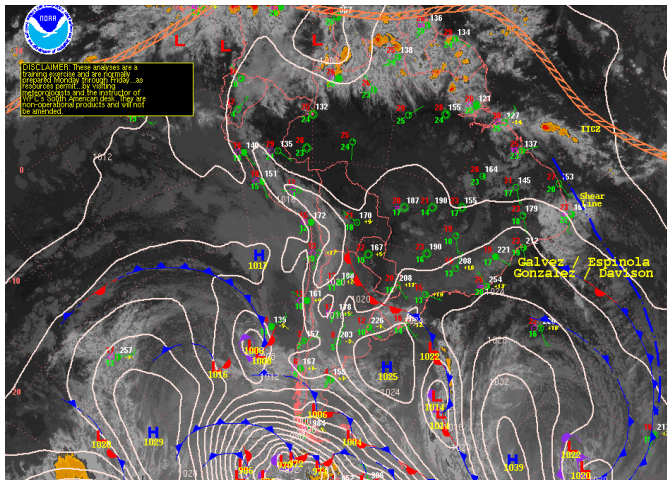
Guidance Products in support of WMO RA-III and IV

Products (non-operational)	WEB	GTS*	EMAIL
Three daily forecast bulletins	✓	✓	
Two daily analysis charts	✓		
Nine daily forecast charts	✓		
Special notices before potential extreme events			✓

*GTS=Global Telecommunications System



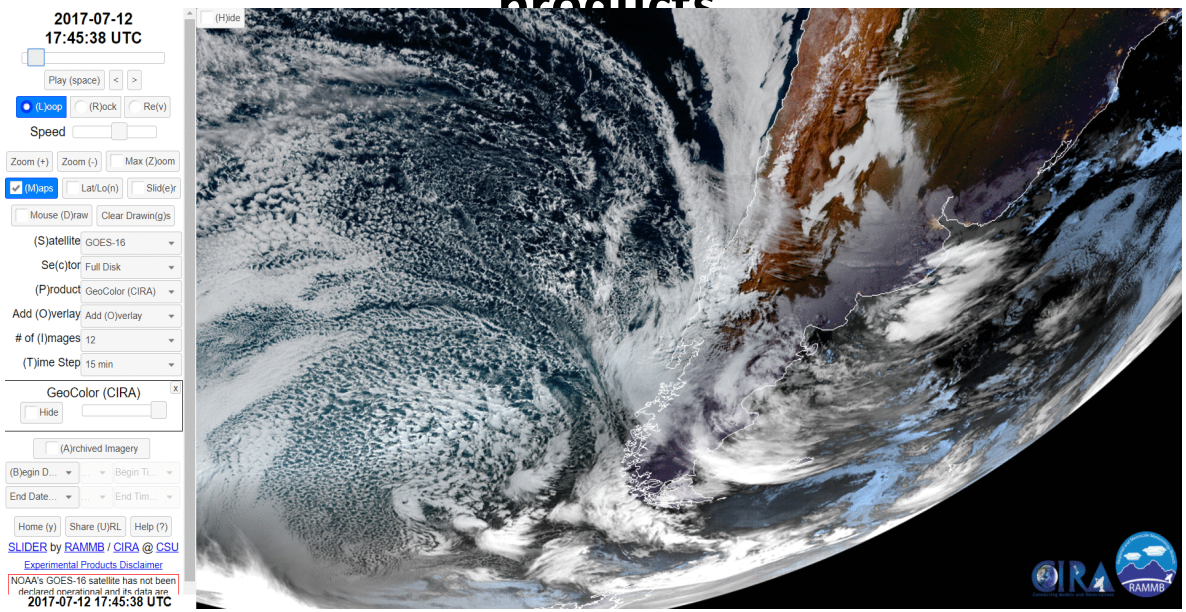
Sample forecast chart



Sample Satellite Analysis Chart

A lot to gain with GOES-16!

GOES-16 is largely improving our training and generation of guidance products



We can see more features that help our understanding of processes!

Engagement Question

From the advantages of GOES-16 for weather monitoring and forecasting, the following training activities should be emphasized in the Int'l desks:

a. Interpretation of RGB channel combinations.

b. Interpretation of processes now resolved by the improved spatial and temporal resolution.

c. Application of lightning mapper data for severe weather detection.

d. Description of the methods used to retrieve derived products (e.g. QPE, lightning data, winds, etc.) from satellite data.

e. Other.

Thank you!

If you have any questions or would like further information, the panelists will be located at a table outside the Great Hall to speak with you